

CYSTICERCOSIS IN THE AREA OF THE WISSEL LAKES, WEST IRIAN

L.R. TUMADA and SRI S. MARGONO

Enarotali Hospital, Enarotali, West Irian and Department of Parasitology, University of Indonesia, Jakarta, Indonesia.

INTRODUCTION

Taeniasis solium is not unusual in the Wissel Lakes area of West Irian. Faecal examinations done in 1972 on 170 hospitalized patients revealed eggs of *Taenia* in 9 per cent (Tumada and Margono, in press). Adult worms expelled by these patients were identified as *Taenia solium*. Cysticerci are common in pork from this area.*

Although cases of cysticercosis have been reported from Indonesia in the past by various authors (Hausman *et al.*, 1950; Lie Kian Joe *et al.*, 1955; Soebroto *et al.*, 1960; Adnjana *et al.*, 1961; and Hadidjaja *et al.*, 1971), all of these cases were of Chinese origin or in Indonesians living in Java or Bali. To date, no cases have been reported from West Irian.

The purpose of this paper is to present the first report on cases of human cysticercosis from West Irian.

MATERIALS AND METHODS

During a period of 6 months in 1972-1973, 13 cases of cysticercosis, including 5 women and 8 men ranging in age from 16 to 40 years, were diagnosed at the Enarotali Hospital, Wissel Lakes area, West Irian. All patients were members of the Ekari tribe. Eleven of them were hospitalized for medical observation.

Subcutaneous nodules from patients with suspected cysticercosis were removed and the

* Kindly identified by the Lembaga Penelitian Penyakit Hewan, Bogor.

biopsies were sent to Jakarta. Histological preparations were made by the Department of Pathology and diagnoses were confirmed by the Department of Parasitology, University of Indonesia, Jakarta.

Symptoms of the patients were recorded. Eleven patients were hospitalized and 2 of these failed to report after biopsy.

During hospitalization, simple, routine laboratory examinations were performed and are summarized below.

RESULTS

Nine of the 13 patients complained of headache with or without dizziness (Table 1). Patient MG had continuous headache. Six patients complained of dizziness prior to epileptic seizures.

Seven patients suffered from loss of consciousness and general convulsions from 1 to 3 times a week. One patient (JD), who lived in a traditional Ekari house, while sleeping in front of an open fire during the night, burnt his feet during an epileptic convulsion. Another patient (DG) was admitted to the hospital because of third-degree burns on both feet. It was suspected that these burns occurred during epileptic seizures at night, although this was denied.

Personality changes were reported by relatives of two patients; they were considered insane. One of them was admitted with haematoma on the face as a result of his neighbour's anger with him. On examination, no signs of psychosis were found although it

Table 1

Symptoms of 13 cysticercosis patients in the Wissel Lakes area.

Symptoms :	Name of patients/age in year													Total 13
	WU 30	MG 30	JD 30	IM 18	PP 40	RG 16	AT 38	IA 25	YD 25	MK 20	DG 30	NA* 18	GX* 28	
Headache/dizziness	+	+	+	-	-	+	+	+	+	+	-	-	+	9
Epileptic seizures	-	+	+	-	-	+	-	+	+	+	-	-	+	7
Personality changes	-	-	+	-	-	-	-	+	-	-	-	-	-	2
Eye complaints (blurred vision/photophobia/diplopia)	+	+	-	-	-	-	+	+	+	+	-	-	-	6
Awareness of subcutaneous nodules :	+	-	-	+	-	-	-	-	-	-	-	+	-	3
Lethargy	+	-	-	-	-	-	+	-	-	-	-	-	-	2
Epigastric/abdominal pain	-	-	-	+	+	+	+	+	-	-	-	-	-	5
Burns			+								+			2

*Note: Out-patients.

was stated that at times he was unconscious of his actions.

The other patient with personality changes (IA) was a teacher who had to give up his profession on account of his condition. He had a constant tic of mastication, sometimes revealed agitation, and suffered from hallucinations. He was in the hospital for 10 months with chronic nephritis. *Taenia* eggs were found in his stools.

Six patients had eye disturbances; 4 had blurred vision. One (AT) suffered from photophobia and another (MK) complained of diplopia. Patient MG had the feeling that his eyes were protruding.

Only 3 patients were aware of nodules under the skin. The number of palpable nodules differed considerably in each person, ranging from one to more than 20. The most easily detectable nodules were on the volar surface of the upper arm (on the *biceps*

muscle) in 9 cases, and the forearm in 7 cases (Table 2). Other nodules were distributed over the lateral portion of the *pectoralis major* muscle (5 cases), the *deltoideus* muscle (4 cases), the neck (4 cases), the abdominal wall (3 cases), and near the mouth (1 case).

Table 2

Localization of palpable cysticercus nodules in 13 patients.

Localization	No. of cases
Region of the <i>Biceps</i> muscle	9
Region of the forearm	7
Region of the lateral portion of the <i>pectoralis major</i> muscle	5
Region of the deltoid muscles	4
Neck	4
Abdominal wall	3
Near the mouth	1

Table 3

Laboratory findings of 11 hospitalized patients with cysticercosis.

	WU	MG	JD	IM*	PP	RG	AT	IA	YD	MK	DG**
Age in year	30	30	30	18	40	16	38	25	25	20	30
Sex	M	M	M	M	M	F	M	M	F	F	F
Haemoglobin (Sahli %)	70	90	70	70	90	80	80	78	60	80	75
Leukocytes/c.mm	10,600	8,000	9,700	16,900	12,400	11,600	6,600	7,700	12,000	11,800	18,900
Differential count (%)											
Eosinophils	6	11	2	0	4	1	5	11	3	4	0
Juvenile Neutrophils	2	0	0	3	1	10	2	2	2	0	2
Segmented Neutrophils	78	55	72	84	72	52	56	64	66	77	90
Lymphocytes	13	24	23	10	20	35	33	19	26	17	6
Monocytes	1	10	3	3	3	2	4	4	3	2	2
Intestinal parasites											
<i>Ascaris lumbricoides</i>	-	+	+	+	+	+	+	+	+	+	+
Hookworm	+	+	+	-	+	+	+	+	+	+	+
<i>T. trichiura</i>	+	+	+	+	+	-	+	-	-	+	+
<i>Taenia solium</i>	-	-	-	-	-	+	+	+	+	-	+
<i>Hymenolepis nana</i>	-	+	-	-	-	-	-	+	+	-	-
<i>Entamoeba histolytica</i> (cysts)	-	-	-	+	+	+	+	-	-	-	-

* IM : suspected of hepatic/amoebiasis.

** DG : with a severe infection of third degree burns on both feet.

The results of routine laboratory examinations of the 13 patients are given in Table 3. They revealed eosinophilia in 4 cases and leukocytosis in 7 cases. The Sahli haemoglobin content ranged from 60 to 90 per cent.

The usual intestinal parasites, including *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworm, were found in most of the stool samples. *Taenia* eggs were found in 5 of the 11 hospitalized patients, and *Hymenolepis nana* eggs were revealed in 3. Four of the cases were passing cysts of *Entamoeba histolytica*.

TREATMENT

Atabrine medication was given to the 5 patients passing *Taenia* eggs. In the evening, before administering atabrine, 30 grams of magnesium sulfate were given to the patient as a purge. All patients received a total dose of 8 atabrine tablets the following morning, 2 tablets every 15 minutes in combination with 0.5 gram of sodium bicarbonate. Two

hours later, another 30 grams of magnesium sulfate were administered. Stools were collected throughout a 48-hour period.

Adult *Taenia solium* were expelled by 3 patients (RG, AT and DG) after a single course of atabrine, and by another patient (IA) after a second course. The fifth patient (YD) could not be followed up.

Although sodium bicarbonate was given in combination with atabrine, nausea and vomiting often occurred.

Hetrazan (diethyl carbamazine) was used in an attempt to treat the cysticercosis in 10 patients. Two were given a daily dose of 200 mg (4 tablets daily for 10 days) while the other 8 patients received two 10-day courses with a daily dose of 200 mg of Hetrazan. Incidal (mebhydrolin-napadisylate), an antihistaminic drug, was given in addition to prevent side effects such as nausea and vomiting.

Two patients (JD and AT), who received single courses of Hetrazan, left the hospital

free of complaints after treatment. One (JD) had neither epileptic seizure nor headache throughout a month of observation after his discharge; symptoms of psychosis also disappeared.

Two other patients (PP and MK) were discharged without any complaints after the second course of Hetrazan. One patient (WU), who also had no complaints after his discharge, received oil of chenopodium, in addition, for his hookworm infection.

After 2 courses of Hetrazan, patient RG, who had suffered from frequent epileptic seizures, returned home without complaints. He also received atabrine, piperazine and oil of chenopodium during hospitalization as treatment for adult *Taenia solium*, *Ascaris lumbricoides*, and hookworm, respectively.

Patient YD reported that her blurred vision had disappeared but her headache and abdominal pain were still present.

Symptoms of psychosis persisted in patient IA after Hetrazan medication. He was also given 300 mg of chlorpromazine per day.

Patient IM had a very enlarged liver (seven finger below the costal margin), nodular, with two swellings of rather soft consistency. Laboratory examinations revealed cysts of *E. histolytica* as well as leukocytosis. Liver biopsy was not performed. It was possible that this patient was suffering from a liver abscess of amoebic origin in addition to the cysticercosis. Chloroquine and other drugs for his intestinal parasites were administered in addition to Hetrazan. His condition deteriorated and one day he fled from the hospital.

No side effects were observed during Hetrazan medication.

DISCUSSION

Although no cranial X-rays were done, 7 patients (MG, JD, RG, IA, YD, MK and

GX) may have suffered from cerebral cysticercosis in addition to having subcutaneous nodules. These patients had epileptic seizures, suffered from headache, and 2 were found with personality changes. Four had ocular complaints. The epileptic seizures had been occurring for weeks or months in these patients. The youngest person in this group was a woman, aged 16 years.

Two reports of cerebral cysticercosis in Indonesia have been published, both cases occurring in middle-aged Indonesians of Chinese extraction (Hausman *et al.*, 1950; Lie Kian Joe *et al.*, 1955). The chief complaints were personality changes, eye disturbances, and headache.

Two cases described by Callais *et al.*, (1955) suffered from convulsions and one of them had personality changes.

Abdominal complaints in the present cases may have been produced by *Taenia solium* or the many other intestinal parasites that were demonstrated.

In cysticercosis, eosinophilia is not consistent. In the present group of patients, 3 cases had more than 5 per cent of eosinophils in their differential count. However, this increase could also have been associated with other intestinal parasites. Soebroto *et al.*, (1960) reported eosinophilic counts of 9 and 15 per cent in his two cases, whereas no increase in eosinophils (3 per cent) was found in the case reported by Hadidjaja *et al.*, (1971).

Leukocytosis, found here in 7 cases, could have been due to other intercurrent infections or burns. Leukocytosis has not been reported in cysticercosis.

The average haemoglobin concentration (Sahli method) was 77.4 per cent. After correction (the altitude at Enarotali is 1,700 meters), this corresponded to 11.5 grams per cent at sea level. This finding was not unex-

pected since cysticercosis is usually not accompanied by severe anaemia.

Cysticercus cellulosae may be found anywhere in the body, although the most common locations are striated muscle, subcutaneous tissue, and the brain, as well as eye, lung, and certain other organs. In the present 13 patients, the most detectable nodules were on the volar surface of the arm in the region of the biceps muscle and the forearm. Other detectable nodules were scattered throughout the body. After biopsy it was revealed that the nodules were found in the muscles. Only 3 of the patients were conscious of the subcutaneous nodules, which were not painful.

Surgical removal of such nodules has been recommended in the treatment of cysticercosis (Hadidjaja *et al.*, 1971) although Callais *et al.*, (1955) reported a considerable improvement in 2 cases suffering from cerebral cysticercosis after treatment with Notezine (diethylcarbamazine). In one case, 2 courses of Notezine were given, each of 10 days duration, combined with Phenergan (promethazine); in the other case, Notezine was administered for 28 days. Symptoms such as auditory hallucinations, flashes of colour, incoherent speech, clonic and tonic spasms, became less frequent and less severe in the first case. Treatment of the second case was only temporarily successful because, after symptoms diminished, the patient was readmitted with more serious symptoms five months later.

In 7 patients in the present group Hetrazan seemed to give some improvement although the observation was not long enough. Also, no decrease in size of the cysticerci was observed. As many other drugs were administered to some of the patients for other intestinal parasites, evaluation of Hetrazan therapy is not possible. Indeed, in 3 patients, the results with this drug seemed doubtful.

SUMMARY

Cysticercosis seems to be not uncommon among the people of the Wissel Lakes, West Irian (Irian Jaya). Thirteen cases were found during a six-month period in 1972-73. Clinically, subcutaneous nodules were found in patients in association with headache or dizziness, epileptic seizures, ocular disturbances (blurred vision, photophobia, diplopia), and personality changes.

Eosinophilia was reported in only 3 of the 13 patients and this may have been associated with the presence of other parasites.

Hetrazan (diethylcarbamazine) appeared to be successful in suppressing the epileptic seizures but observations were too short to permit a proper evaluation of the usefulness of this drug in treating cysticercosis. No side effects accompanied Hetrazan administration, perhaps because antihistaminic drugs were given concomitantly.

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